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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,031	04/08/2004	Nathalie Martin	VA30448	9237

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ALSTOM POWER INC.
INTELLECTUAL PROPERTY LAW DEPT.
P.O. BOX 500
WINDSOR, CT 06095

EXAMINER

PAPE, ZACHARY

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,031

Applicant(s)

MARTIN ET AL.

Examiner

Zachary M. Pape

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 8, 9 and 16 is/are rejected.
- 7) ☒ Claim(s) 4, 6-7, 10-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/21/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Iversen (US 5,003,376).

With respect to claim 1, Iversen teaches a power switching module (Column 2, Lines 1-4) comprising: at least one power module (20) placed above at least one other power switch (As illustrated in Fig 1), each power switch including upper walls and lower walls each adapted to be cooled through thermal conduction by a cooling medium (Column 1 Line 63 – Column 2 Lines 1); lower closed channels and upper closed channels configured to circulate a cooling medium along said lower walls and said upper walls, respectively (As illustrated in Fig 1), of said at least one power switch and of said at least one other power switch; and a lower passage in said power switch along and above said upper wall of said at least one other power switch, and an upper passage in said power switching module along and below said lower wall of said at least one power switch such that said upper walls are cooled by circulating a cooling medium in said lower passage and said lower walls are cooled by circulating a cooling medium in said upper passage (As illustrated in present office action Fig 1 below).

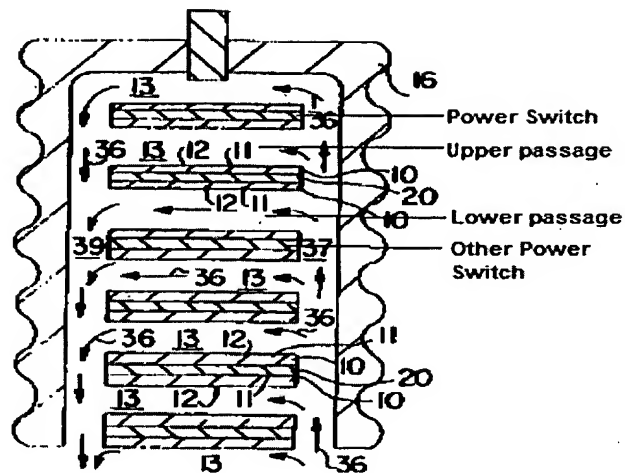


Fig 1

With respect to claim 2, Iversen further teaches that the lower passage and said upper passage have two ends interconnected to form a single cooling medium circulation circuit (As illustrated in Fig 1).

With respect to claim 8, Iversen further teaches that at least one end of either one of said upper passage and said lower passage and at least one end of either one of said lower closed channels and said upper closed channels are connected to a common inlet (36) connector for receiving the cooling medium and to a common outlet connector (38) for discharging the cooling medium (As illustrated in Fig 1).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 5, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iversen in view of Lindberg et al. (US 5,504,378).

With respect to claim 3, Iversen teaches the limitations as disclosed in claim 1 above, but fails to teach a heat sink as disclosed in claim 3. Lindberg et al. teaches a power switch cooling module with a heat sink (146) in direct contact with a cooling medium (See Fig 6A,B). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the heat sink of Lindberg et al. with the power switch cooling module of Iversen to increase heat transfer between the switching elements and the cooling fluid as it passes through the heat sink (Lindberg; Column 6, Lines 7-13).

With respect to claim 5, Lindberg et al. further teaches that the fins of said heat sink extend parallel to the direction of circulation of the cooling medium (As illustrated in Fig 6A,B).

With respect to claim 9, Iversen teaches the limitations as described in claim 1 above, but fails to teach that the cooling medium is a liquid such as water. Lindberg et al. teaches that the cooling medium is a liquid such as water (Lindberg; Column 5, Lines 58-60).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iversen.

With respect to claim 16, Iversen teaches the limitation of claim 1 above, but fails to teach specifically that the height of the upper and lower passages are not greater

than 1mm. It would have been an obvious matter of design choice to limit the fluid passages of Iversen to not greater than 1mm in height since such modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955). Keeping the height of the passages to less than 1mm would limit the overall size of the cooling module thus keeping the module compact.

Allowable Subject Matter

3. Claim 17 is allowed.

The following is an examiner's statement of reasons for allowance:

4. The allowability resides in the overall structure of the device as recited in independent claim 17 and at least in part because claim 17 recites, "A multiphase inverter... comprises two interrupters, and wherein said two interrupters of the same phase comprise a single power switching module".

Iversen teaches a power switching module, but fails to teach that the module comprises a multiphase inverter or two interrupters of the same phase.

The aforementioned limitations in combination with all remaining limitations of claim 17 are believed to render said claim 17 patentable over the art of record.

5. Claims 4, 6, 7, 10-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

6. With respect to claim 4, the allowability resides in the overall structure of the device as recited in dependent claim 4 and at least in part because claim 4 recites, "wherein **only** said upper wall of said at least one power switch includes a heat sink, and **only** said lower wall of said at least one other power switch includes a heat sink"

The aforementioned limitations in combination with all remaining limitations of claims 1, 3, and 4 are believed to render said claim 4 patentable over the art of record.

7. With respect to claims 6 and 7, the allowability resides in the overall structure of the device as recited in dependent claims 6 and 7 and at least in part because claims 6 and 7 recite, "...form a single cooling medium circulation circuit along said upper wall of said at least one power switch and along said lower wall of said at least one other power switch"

The aforementioned limitations in combination with all remaining limitations of claims 1, 6 and 1, 7 are believed to render said claims 6 and 7 patentable over the art of record.

8. With respect to claims 10-12, the allowability resides in the overall structure of the device as recited in dependent claim 10 and at least in part because claim 10 recites, "first electrical tracks... being formed on an inside surface of one of either said upper walls and said lower walls that is cooled by the cooling medium circulating in one of either said lower passage and said upper passage"

The aforementioned limitations in combination with all remaining limitations of claims 1, and 10 are believed to render said claim 10 and all dependents therefrom (11, 12) patentable over the art of record.

9. With respect to claims 13-15, the allowability resides in the overall structure of the device as recited in dependent claims 13 and 15 and at least in part because claims 13 and 15 recite, "a spacer... wherein said spacer includes a housing for each of said at least one power switch and said at least one other power switch"

The aforementioned limitations in combination with all remaining limitations of claims 1, 13 and 1, 15 are believed to render said claims 13 and 15 and all dependents therefrom (14) patentable over the art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4,884,168; US 6,442,023; US 6,865,080; US 3,921,201; US 5,606,201; US 6,084,771 all further disclose liquid cooled switches.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary M. Pape whose telephone number is 571-272-

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2201. The examiner can normally be reached on Mon. - Thur. & every other Fri.
(8:00am - 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached at 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ZMP

A handwritten signature in black ink, appearing to read 'A. Vortman', with a long horizontal flourish extending to the right.

**ANATOLY VORTMAN
PRIMARY EXAMINER**